

REMARKS

This *Substitute Amendment* replaces the previous communication filed March 19, 2004.

This application is a divisional of U.S. Serial No. 09/793,874, now United States Patent No. 6,627,041. In the Official Action of November 19, 2003, all of the pending claims were rejected over various references on the basis of obviousness only over various references including:

U.S. Patent No. 4,409,065 to *Kasser*;  
U.S. Patent No. 4,166,001 to *Dunning et al.*;  
U.S. Patent No. 4,455,237 to *Kinsley*;  
U.S. Patent No. 4,431,479 to *Barbe et al.*; and  
WIPO Publication WO 97/43483 to *Kimberly-Clark*.

In the Office Action of April 2, 2004 it was noted Claims 1-12 and 14-63 were not listed as canceled. That oversight has been corrected by submission of this *Substitute Amendment*.

The references cited differ substantially from the invention in this application which relates generally to sheet products using pulp which has been efficiently provided with durable curl in a matter of seconds. Long heat treatment times and mechanical pulp as taught by *Barbe et al.* '479 are not required. The art is readily distinguished on the basis of sheet composition by the amendments to the claims which call for sheet containing curled fiber and uncurled fiber which is otherwise identical to the curled fiber in the sheet.

The references are not believed to remotely suggest the invention as now claimed. Rather, the references, by and large, relate to the preparation of expensive and difficult to manufacture fiber additive pulps or fiber curl which is not durable, e.g., *Kasser* '065.

In contrast to the prior art, the invention makes it practical to simply curl fiber in connection with an existing manufacturing facility without the need for a separate pulp source. The processing is so fast the fiber with durable curl can be produced from pulp on hand as needed to reduce tensile, increase bulk or absorbency as desired in the product.

Support for the amendments to the claims and the new claims is found at pages 38-39 of the application as filed, Examples 36-40 which are recycle fiber where 0, 20, 40, 60, 80 and 100 percent of the fiber used to make the sheet is curled. The uncurled fiber in the sheet is the same pulp. *Note also* the porofil values of the new claims appear in Table 9. Porofil, *per se*, is defined at page 21 of the application as filed.

If needed, further differences between the prior art and this invention are enumerated in the following Table 1:

Table 1 – Comparison of Art Cited with U.S. Serial No. 10/625,086 (U.S. Patent No. 6,627,041)

<u>Features</u>	<i>Lee</i> US 6,627,041	<i>Barbe</i> US 4,431,479	<i>Hermans</i> WO 97/43483	<i>Dunning</i> US 4,166,001
<u>Fiber Type</u>  (Text Col/Lines)	cellulosic fiber including Kraft fiber	wood chips refined to produce high yield or ultra high yield lignin containing pulps	modified wet-resilient fibers: chemically cross linked cellulosic fibers, heat-cured cellulosic fibers, mercerized fibers, and sulfonated fibers	strongly bonding fibers layered with weakly bonding fibers
<u>Processing/Equipment</u>  (Text Col/Lines)	disk refiner	Production of wood pulp nodules or entangled masses from wood chips in high consistency refining followed by retention at high temperature in pressure vessel; separate and sole heat treatment at high consistency	High intensity nip press with rush transfer	No fiber processing done - requires a 3 layered laminar flow headbox on a paper machine
<u>Power</u>  (Text Col/Lines)	low enough to preclude substantial fibrillation - less than about 1 hpday/ton	no specification	1.5 hpday/ton	No specification  (Example 1)

Table 1 – Comparison of Art Cited with U.S. Serial No. 10/625,086 (U.S. Patent No. 6,627,041) (Cont'd)

Features	<i>Lee</i> US 6,627,041	<i>Barbe</i> US 4,431,479	<i>Hermans</i> WO 97/43483	<i>Dunning</i> US 4,166,001
Moisture	60-70 %	65-85%	95%	No specification
Steam Pressure/Temperature	5-150 psig	100-170C	200C	No specification
Time	0.01-20 Seconds	2-60 Minutes	20 minutes	No specification
<u>Fiber Characteristics</u> (Text Col/Lines)	curl index at least 20% higher	curled, kinks twists, microcompressions 4/23-29, 6/18-19	wet resiliency	Strongly bonding and weakly bonding papermaking fibers
<u>Permanence/Permanence</u> (Text Col/Lines)	retained for at least 30 minutes under agitation at 120F	Permanent (4/23-29)	not specified	No specification

Table 1 – Comparison of Art Cited with U.S. Serial No. 10/625,086 (U.S. Patent No. 6,627,041) (Cont'd)

<u>Features</u>	<i>Lee</i> US 6,627,041	<i>Kasser</i> US 4,409,065	<i>Kinsley</i> US 4,455,237	<i>Eber</i> US 5,102,501
<u>Fiber Type</u> (Text Col/Lines)	cellulosic fiber including Kraft fiber	Kraft	lignin-containing wood chips or fibrous plant material lignin content at least 10% (C1-37, C2-19)	cellulosic papermaking fibers natural cellulosic wood papermaking fibers (C3-55-58)
<u>Processing Conditions</u> (Text Col/Lines)	disk refiner	conventional beater or refiner followed a separate curling step in a curlator or Kollergang, followed by "low tension" drier (1/52-61)	Disk Refiner	Hammermill 6/42-48
<u>Power</u>	low enough to preclude substantial fibrillation - less than about 1 hpday/ton	No specification	8-35 HPD/Ton	

Table 1 – Comparison of Art Cited with U.S. Serial No. 10/625,086 (U.S. Patent No. 6,627,041) (Cont'd)

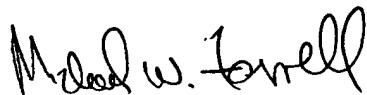
Features	<i>Lee</i>	<i>Kasser</i>	<i>Kinsley</i>	<i>Eber</i>
<u>Moisture</u>	US 6,627,041 60-70%	US 4,409,065 20-60%	US 4,455,237 substantially dry	US 5,102,501 dry
<u>Steam</u>	5-150 psig	No specification	90-120 PSIG	no steam - temperature 60-120F
<u>Pressure/Temperature</u>				
<u>Time</u>	0.01-20 Seconds			
<u>Fiber Characteristics</u>	curl index at least 20% higher	average curl exceeding 1.3	Smooth walled Fibril Free Tubular "dry spaghetti" appearance free of kinks and curls	twists, kinks, curls, crimps, or the like deformed hydrophilic curls
(Text Col/Lines)		(2/62-64)		(1/11-17)
<u>Permanence/Permanence</u>	retained for at least 30 minutes under agitation at 120F	low - web must be formed promptly before the fibers straighten	Not mentioned	less than 3-5 minutes see Claims 1 and 2
(Text Col/Lines)		(3/3-14)		(3/1-7) (6/12-15)

Applicants also enclose herewith a copy of the *Declaration of Jeffrey A. Lee*, filed May 7, 2002 in the parent application to be made of record in this application which provides still further reasons why the present invention is patentable over the art.

Finally, the terminology "at least 20% higher ..." in Claim 13 was objected to in the outstanding Office Action. That terminology has been replaced with the quantitative value appearing in Claim 73, as well as in the specification as filed at page 14 and also at page 39, Table 9.

In view of the above amendments and Remarks, this application is believed in condition for allowance. If for any reason the Examiner would like to discuss this case, the Examiner is invited to call at the number listed below.

Respectfully submitted,



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April 6, 2004